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(54) **1,7-DISUBSTITUTED
PERYLENE-3,4,9,10-TETRACARBOXYLIC
ACIDS, THEIR DIANHYDRIDES AND
DIIMIDES**

(75) Inventors: **Arno Böhm**, Mannheim; **Harald Arms**,
Worms; **Georg Henning**; **Peter
Blaschka**, both of Ludwigshafen, all of
(DE)

(73) Assignee: **BASF Aktiengesellschaft**,
Ludwigshafen (DE)

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C09B 67/20

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106/401; 106/499; 524/90; 8/568

(58) **Field of Search** 546/37; 106/287.21,
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(56) References Cited

U.S. PATENT DOCUMENTS

4,431,806	2/1984	Spietschka et al.	546/37
4,496,731	1/1985	Spietschka et al.	546/37
4,667,036	5/1987	Iden et al.	546/37
5,248,774	9/1993	Dietz et al.	544/125
5,677,417	10/1997	Mueller et al.	528/310

FOREIGN PATENT DOCUMENTS

412122	4/1925	(DE)
0 039 912	11/1981	(EP)
0 227 980	7/1987	(EP)
967178	8/1964	(GB)
WO 94/25504	11/1994	(WO)

OTHER PUBLICATIONS

Rohr, U. et al. : Liquid crystalline coronene derivatives with
extraordinary fluorescence properties. Angew. Chem. Int.
Ed. vol. 37, pp. 1434–1437, 1998.*

Abstract No. 23496v, V.I. Rogovik et al, "Chemistry of
perylene. Halo derivatives of 3,4,9,10-perylenetetracar-
boxylic acid.", Jan. 16, 1989, vol. 110, No. 3, p. 513, col. 2.

* cited by examiner

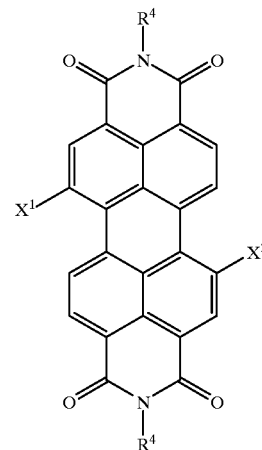
Primary Examiner—Charanjit S. Aulakh

(74) *Attorney, Agent, or Firm*—Oblon, Spivak, McClelland,
Maier & Neustadt, P.C.

(57) ABSTRACT

A 1,7-disubstituted perylene-3,4,9,10-tetracarboxylic diim-
ide of the general formula VI

VI



where

X¹ and X² are independently bromine or —L—R, where
L is 1,2-ethylene, 1,2-ethynylene or 1,2-ethynylene and
R is hydrogen or C₁–C₃₀-alkyl whose carbon chain can
be interrupted by one or more groups —O—, —S—,
—NR³—, —CO— and/or —SO₂— and/or which
can be substituted one or more times by —COOR³,
—SO₃R³, hydroxyl, cyano, C₁–C₆-alkoxy, C₅–C₈-
cycloalkyl or aryl or by a 5- to 7-membered hetero-
cyclic radical which is attached via a nitrogen atom
and can include further heteroatoms and/or can be
aromatic, R³ being hydrogen or C₁–C₆-alkyl.

7 Claims, No Drawings